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(54) **A pressing force stabilizing quickly palate expanding device**

(57) A quick expander for quickly transversely or sagittally expanding a human palate, while stabilizing applied pressing forces, **characterized in that** said expander comprises a central body including a pair of mutually movable blocks therefrom respectively extend a pair of

right palate bars and a pair of left palate bars, each said bar pair having respective bar end portions which are respectively coupled to a right dental element and a left dental element, said expander further comprises a single driving bar operating between said blocks so as to reduce an overall size of said expander.

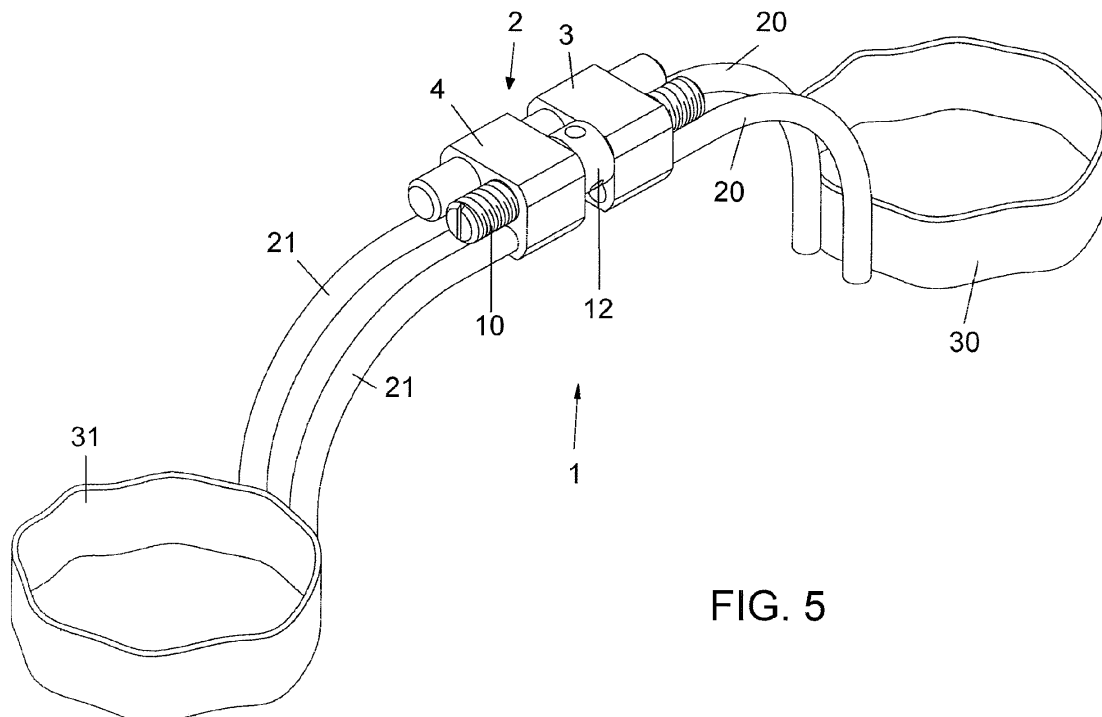


FIG. 5

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Description

[0001] The present invention relates to a cross or sagittal pressing force or stress stabilizing quickly palate expanding device, designed for properly stabilizing applied forces or stresses.

[0002] As is known, for properly correcting defects or "disgnatia" due to a reduction of the cross diameter of the top maxilla or jawbone, it has been found as efficient to carry out a disjunction operation of the palatine structure by an orthopedic device, which is conventionally called "quick palate expander".

[0003] Typical prior approaches or solutions provide to connect to an expanding support central body four bars to be coupled to four permanent or deciduous molar teeth, just to provide an expanding thereof.

[0004] Other prior solutions provide to perform a connection to two molar teeth only. However, both the above approaches have been found as inefficient, in particular with respect to the possibility of a generation of undesired twisting stresses on the orthodontic apparatus, thereby modifying a proper pushing stress to be provided for expanding palate.

SUMMARY OF THE INVENTION

[0005] Accordingly, the aim of the present invention is to overcome the above mentioned drawbacks, by providing a pressing force or stress stabilizing quickly palate expanding device allowing pressing stresses to be always held in a properly oriented condition, without generating torsional or twisting stresses susceptible to deform or disalign the orthodontic device or apparatus.

[0006] Within the scope of the above mentioned aim, a main object of the invention is to provide such a pressing force stabilizing quickly palate expanding device adapted to also provide an optimum oral hygienic condition and which, moreover, is very comfortable to the user.

[0007] Another object of the present invention is to provide such a pressing force stabilizing quickly palate expanding device which, owing to its specifically designed constructional characteristics, is very reliable and safe in operation.

[0008] Yet another object of the present invention is to provide such a pressing force stabilizing quickly palate expanding device which may be easily made starting from easily commercially available elements and materials and which, moreover, is very competitive from a mere economic standpoint.

[0009] According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a quick expander for quickly transversely or sagittally expanding a human palate, while stabilizing applied pressing forces, characterized in that said expander comprises a central body including a pair of mutually movable blocks therefrom respectively extend a pair of right palate bars and a pair of left palate

bars, each said bar pair having respective bar end portions which are respectively coupled to a right dental element and a left dental element, said expander further comprises a single driving bar operating between said blocks so as to reduce an overall size of said expander.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] Further characteristics and advantages of the present invention will become more apparent hereinafter from the following detailed disclosure of a preferred, though not exclusive, embodiment of a pressing force stabilizing quickly palate expanding device, which is illustrated, by way of an indicative, but not limitative, example in the accompanying drawings, where:

Figure 1 is an exploded perspective view of the palate expander according to the present invention;

Figure 2 shows the inventive palate expander in an assembled condition thereof;

Figure 3 shows a top plan view of the palate expander according to the present invention;

Figure 4 is a cross-sectional view substantially taken along the line IV-IV of figure 3;

Figure 5 shows a further perspective view of the palate expander with elements thereof coupled to the molar teeth;

Figure 6 is yet another exploded perspective view of a different embodiment of the inventive palate expander;

Figure 7 shows the palate expander of figure 6, in an assembled condition thereof; and

Figures 8, 9 and 10 show the inventive palate expander including a plurality of guide pins having different cross-sections thereof.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0011] With reference to the number references of the above mentioned figures, the inventive expander, which has been generally indicated by the reference number 1, comprises a central body 2, including a pair of mutually movable blocks and, more specifically, a right block 3 and a left block 4.

[0012] Said blocks may be moved with respect to one another owing to the provision of a driving oppositely threaded screw 10 engaging in recesses 11 defined by said blocks 3 and 4.

[0013] Moreover, said screw 10 comprises an enlarged central portion 12 allowing it to be connected to a torque or rotatively driving tool.

[0014] The mutual displacement of said blocks 3 and 4 is guided by a guide pin 15, having a circular cross-section, engaging in circular recesses 16 which are correspondingly defined on said blocks 3.

[0015] A main feature of the present invention is that from each of said blocks a pair of palate bar extend and,

more precisely, a right palate bar pair 20 extending from the block 3, and a pair of left palate bars 21, extending from said block 4.

[0016] Said bars are parallel to and spaced from one another and, at their free end portions are respectively adapted to be coupled to a right dental element and a left dental element.

[0017] To provide an easily performed connection, are moreover herein provided a right orthodontic band or strip 30 and a left orthodontic band or strip 31, which may be easily coupled to a set dental element to provide a target pushing stress or force thereon.

[0018] According to a modified embodiment, shown in figures 6 and 7, said guide pin or peg has a polygonal cross section and, in particular a rectangular guide pin 40 or a square guide pin engaging in mating recesses 41 correspondingly defined on said blocks are herein provided.

[0019] As shown in figures 8, 9 and 10, the guide pin 40 has respectively an hexagonal, octagonal, and tri-lobe configuration or pattern.

[0020] Thus, by the above made structure, it is possible to apply on the teeth desired pushing forces or stresses, without causing torsion phenomena or deforming the palatine bars, since the provision of a parallel and spaced bar pair allows to optimally absorb efforts or stresses even of a comparatively high value.

[0021] Moreover, by the above disclosed device it is possible, at each actuating of the expander central screw, to provide a proper pressure on the dental or tooth elements, corresponding to about 8-9 kilograms, which, being directly discharged or applied on two dental elements, will apply on each said dental element a pressing force of about 4 kilograms for respectively each said dental element.

[0022] Accordingly, the above disclosed device is a quick palate expander which is particularly useful from a mere constructional standpoint and which is adapted to apply corrective pushing stresses on the dental elements.

[0023] It should be apparent that the invention is susceptible to several modifications and variations, all of which will come within the scope of the invention.

[0024] Moreover, all the disclosed constructional details may be replaced by other technically equivalent elements.

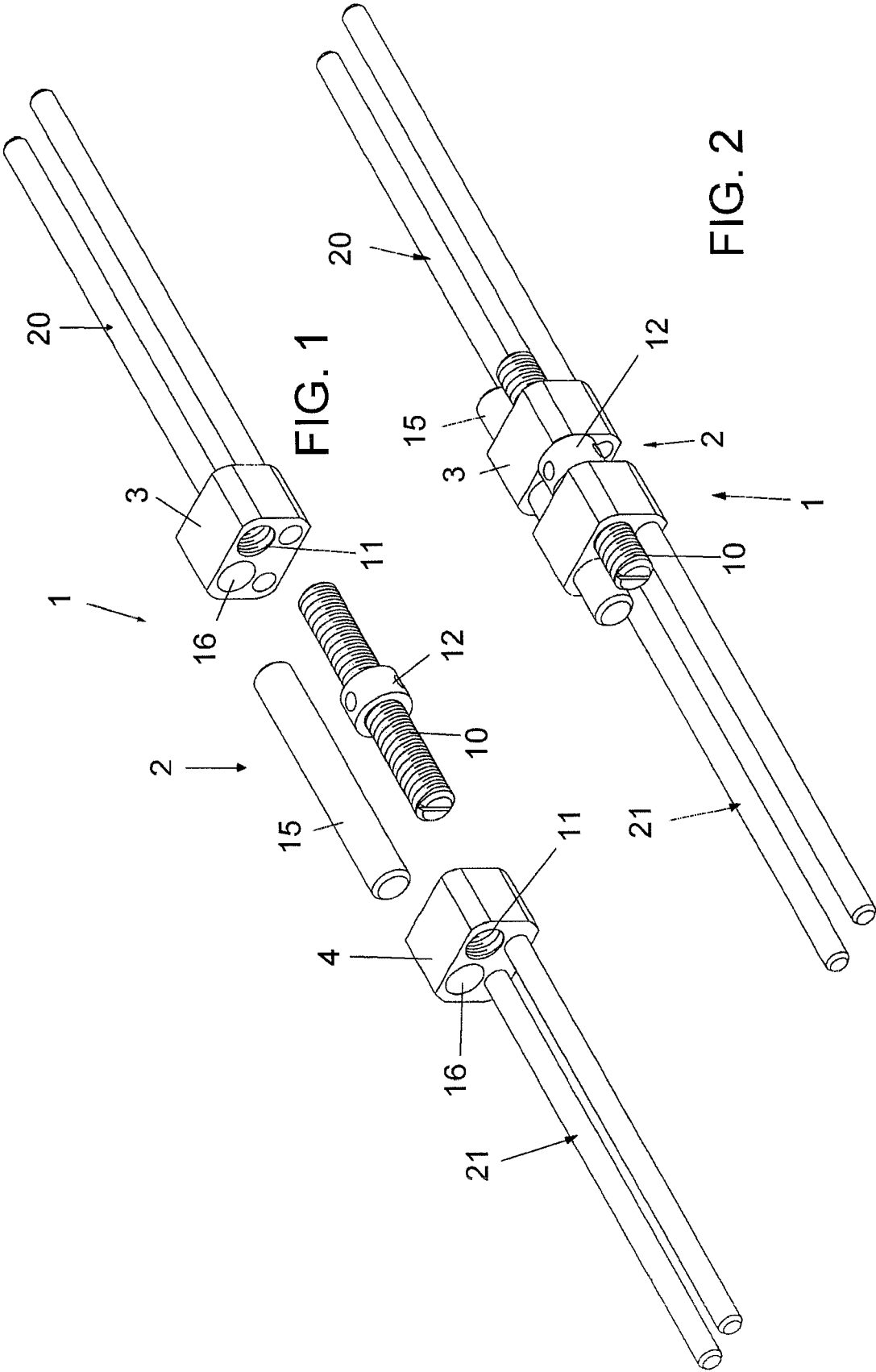
[0025] In practicing the invention, the used materials, provided that they are compatible to the intended application, as well as the contingent size and shapes, can be any, according to requirements.

tually movable blocks therefrom respectively extend a pair of right palate bars and a pair of left palate bars, each said bar pair having respective bar end portions which are respectively coupled to a right dental element and a left dental element, said expander further comprises a single driving bar operating between said blocks so as to reduce an overall size of said expander.

2. A quick expander, according to claim 1, **characterized in that** said driving bar has a circular cross-sectional shape.
3. A quick expander, according to claim 1, **characterized in that** said driving bar has a square cross-sectional shape.
4. A quick expander, according to claim 1, **characterized in that** said driving bar has a rectangular cross-sectional shape.
5. A quick expander, according to claim 1, **characterized in that** said expander further comprises, between said blocks, a driving oppositely threaded screw having a central enlarged portion.
6. A quick expander, according to claim 1, **characterized in that** said driving bar has a tri-lobe cross-sectional shape.
7. A quick expander, according to claim 1, **characterized in that** said driving bar has an hexagonal cross-sectional shape.
8. A quick expander, according to claim 1, **characterized in that** said driving bar has an octagonal cross-sectional shape.

Claims

1. A quick expander for quickly transversely or sagittally expanding a human palate, while stabilizing applied pressing forces, **characterized in that** said expander comprises a central body including a pair of mu-



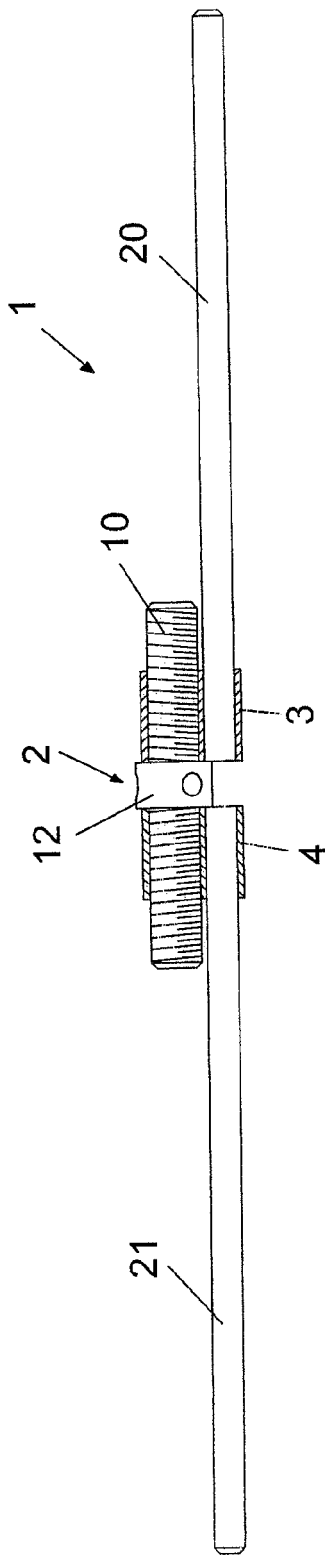


FIG. 4

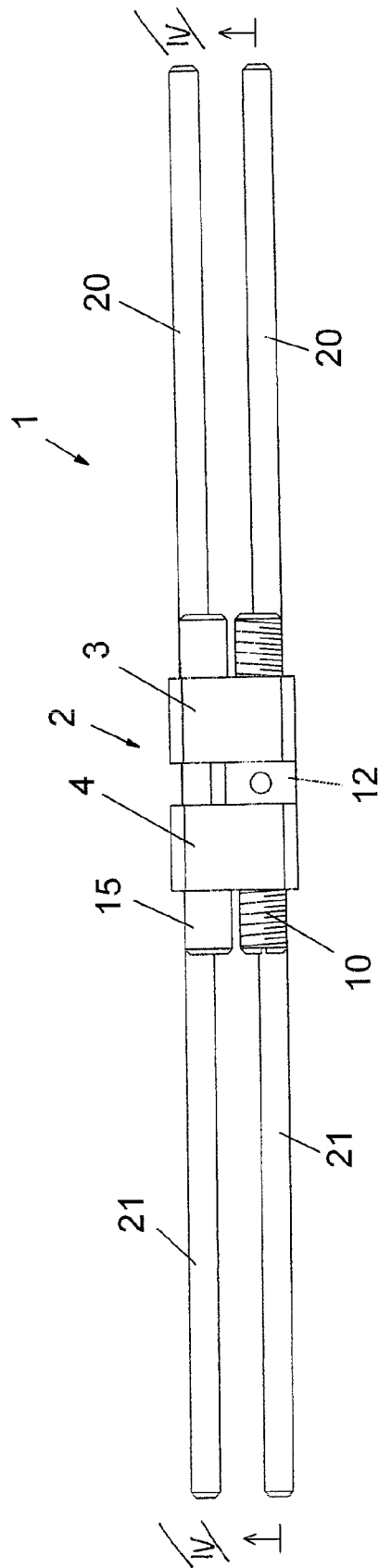


FIG. 3

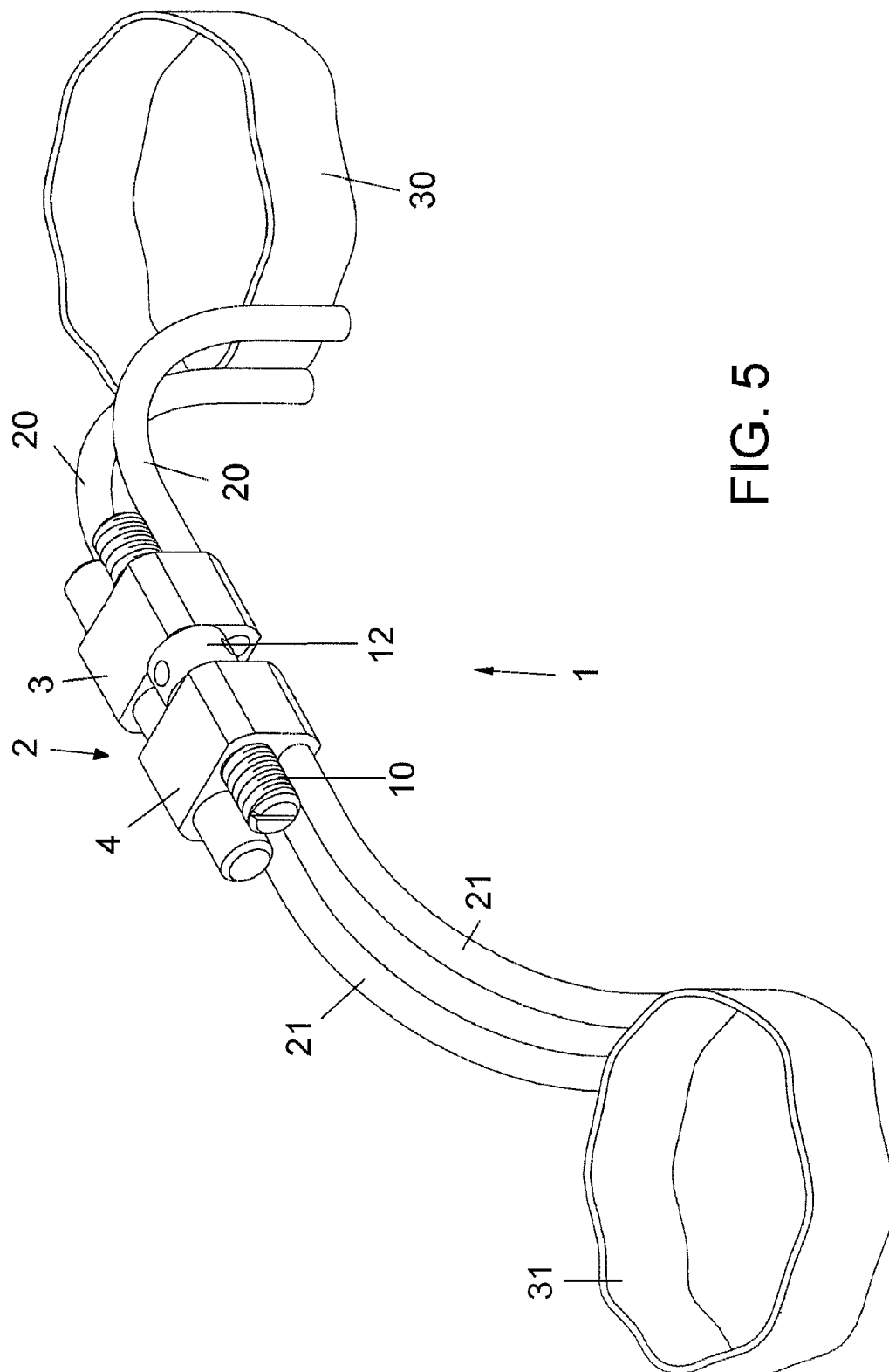
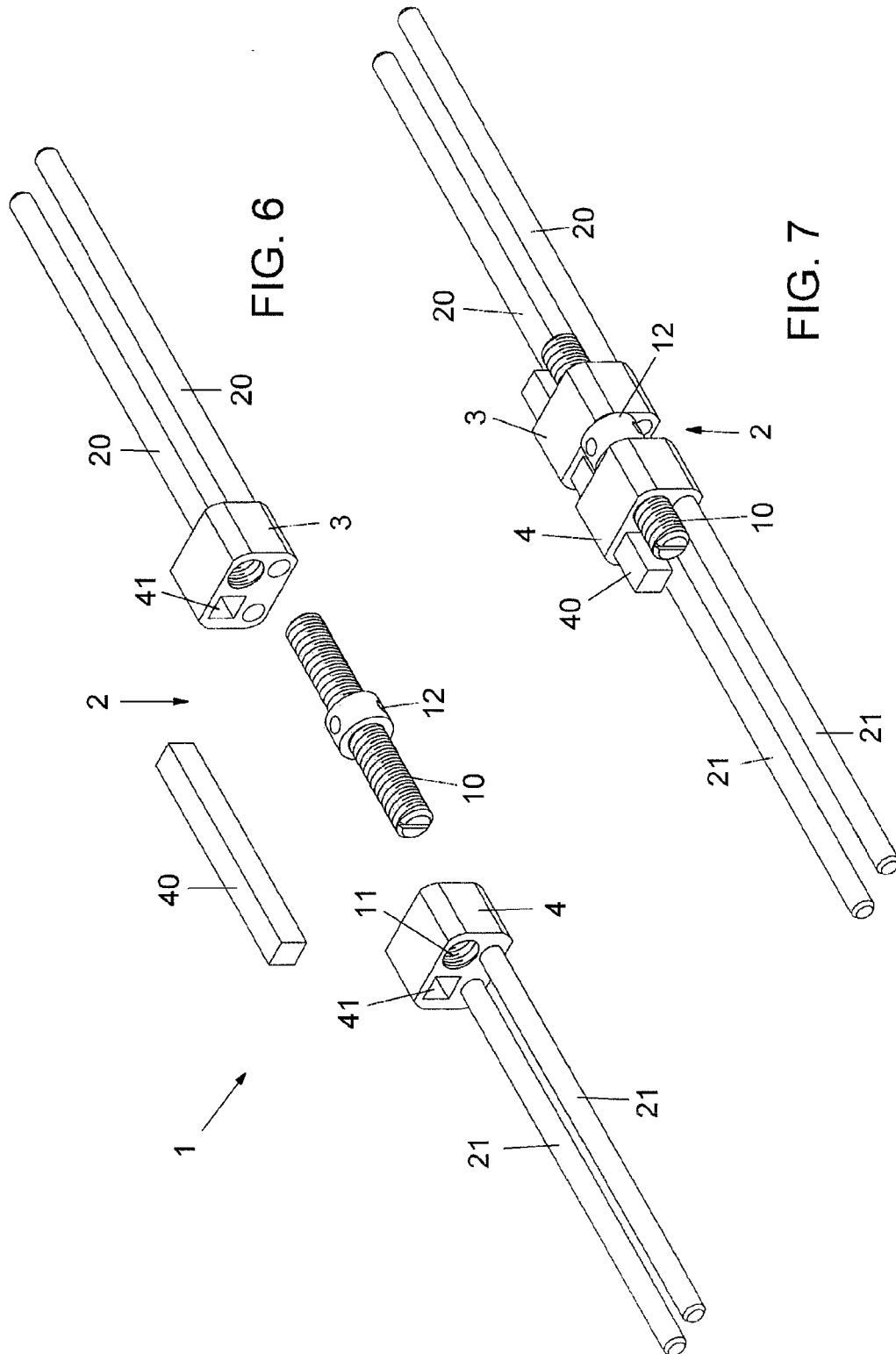


FIG. 5



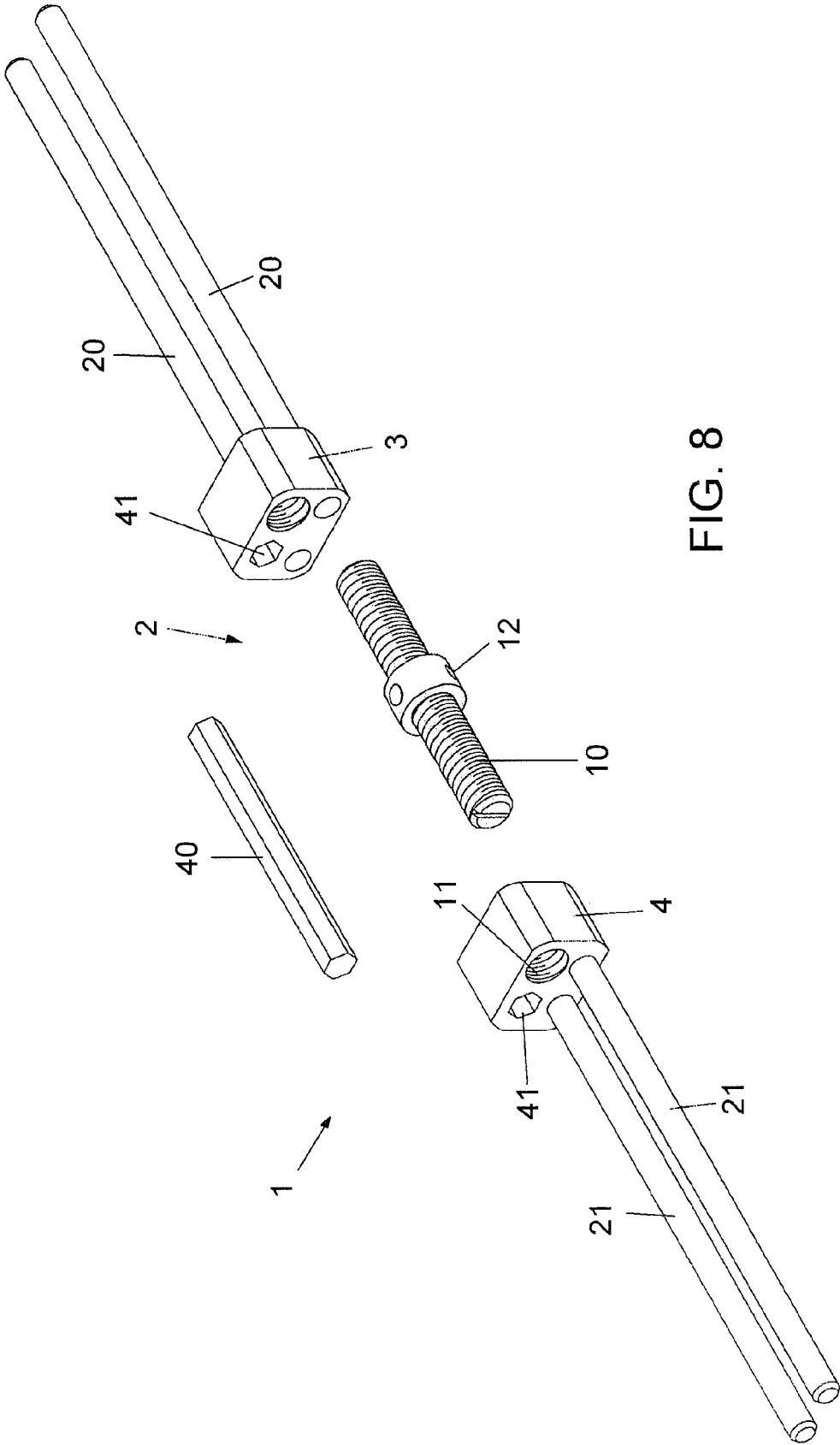


FIG. 8

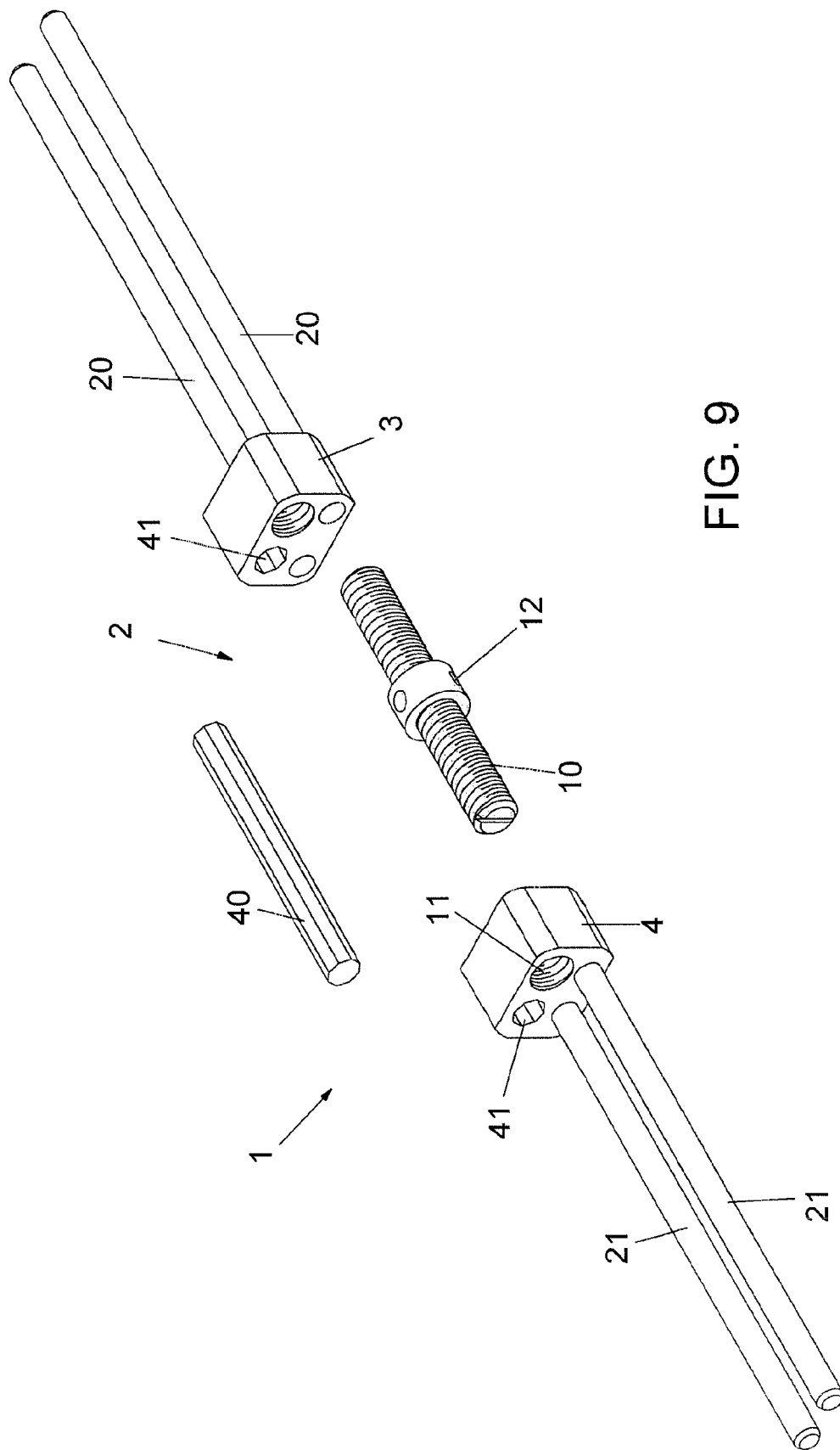


FIG. 9

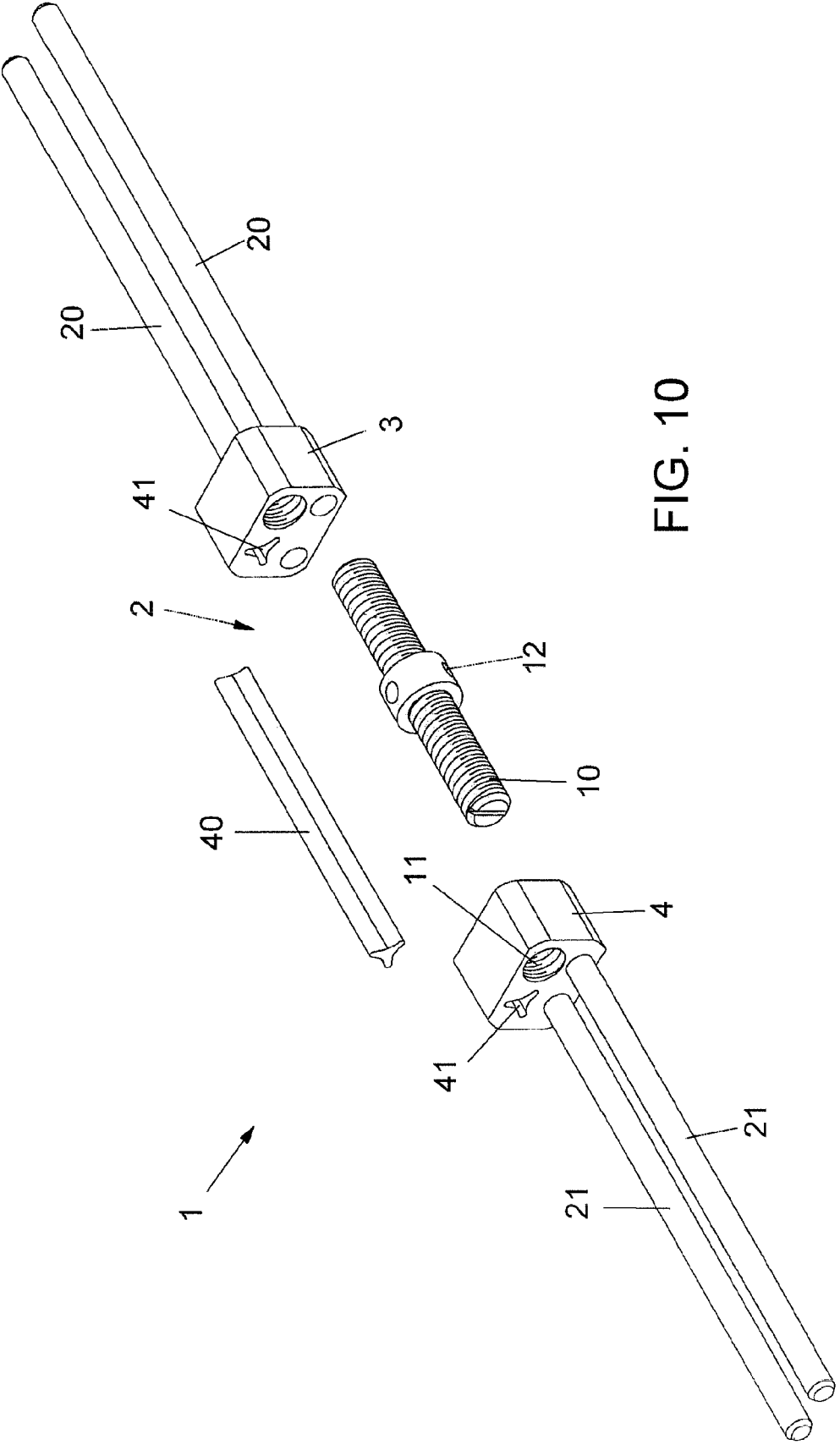


FIG. 10



EUROPEAN SEARCH REPORT

Application Number
EP 10 18 6648

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2005/037313 A1 (HUGE SCOTT A [US] ET AL) 17 February 2005 (2005-02-17)	1,2,5	INV. A61C7/10
Y	* figures 2-6 *	3,4,6-8	
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Y	* figures 1,9,10 *	3,6-8	
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Y	* figure 9 *	3,4,6-8	
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	* figures 1,3,5 *		
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			A61C
Place of search		Date of completion of the search	Examiner
Munich		2 February 2011	Salvatore, Claudio
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 10 18 6648

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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